

Amendments to the Claims:

Please cancel claims 49-68.

Please amend claims 1, 5, and 37.

These amendments introduce no new matter and support for the amendment is replete throughout the specification and claims as originally filed. These amendments are made without prejudice and are not to be construed as abandonment of the previously claimed subject matter, or agreement with any objection or rejection of record.

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (Currently amended) A compound storage and retrieval system comprising:

- (a) one or more storage modules comprising a lockable door controlling access to one or more racks within the storage module, which racks comprise one or more slots, which slots receive one or more trays;
- (b) a work area, providing operator access to the one or more storage modules; and,
- (c) a computer system, operably coupled to the storage modules that implement one or more tray transfer operations between the storage module and the work area, wherein the computer system controls the lockable door of the storage module to prevent errors in replacement of trays into an incorrect slot or storage module.

Claim 2. (Original) The compound storage and retrieval system of claim 1, wherein the work area has a low relative humidity.

Claim 3. (Original) The compound storage and retrieval system of claim 1, wherein the work area temperature is 1°C to 8°C and has a relative humidity of less than 40%.

Claim 4. (Original) The compound storage and retrieval system of claim 1, further comprising an antechamber comprising: operator access to the work area, a low relative humidity, and a temperature from 4°C to 20°C.

Claim 5. (Currently amended) The compound storage and retrieval system of claim 1, wherein the computer system transmits one or more commands directing function of a lock in the lockable door of the storage module, which lock controls operator access to the storage module.

Claim 6. (Original) The compound storage and retrieval system of claim 5, wherein the lock comprises 100 pounds of magnetic locking force or more, and which lock is controllable by the computer system.

Claim 7. (Original) The compound storage and retrieval system of claim 1, wherein the computer transmits one or more commands directing actuation of one or more tray location indicators that direct an operator to a tray location of interest.

Claim 8. (Original) The compound storage and retrieval system of claim 1, wherein the lockable door opens sufficiently to allow removal of the racks.

Claim 9. (Original) The compound storage and retrieval system of claim 1, wherein the storage modules comprise an internal temperature of -20°C or less.

Claim 10. (Original) The compound storage and retrieval system of claim 1, wherein the storage modules comprise temperature control at temperature settings ranging from about -20°C to about -55°C .

Claim 11. (Original) The compound storage and retrieval system of claim 10, wherein the storage modules are temperature controlled to a precision within 2°C of a desired temperature setting.

Claim 12. (Original) The compound storage and retrieval system of claim 1, wherein the racks comprise slots arranged in rows and columns.

Claim 13. (Original) The compound storage and retrieval system of claim 12, wherein the racks each comprise: 10 or more rows and 4 or more columns of slots.

Claim 14. (Original) The compound storage and retrieval system of claim 13, wherein the racks each comprise: 30 or more rows and 5 or more columns of slots.

Claim 15. (Original) The compound storage and retrieval system of claim 14, wherein the racks each comprise: 50 or more rows and 6 or more columns of slots.

Claim 16. (Original) The compound storage and retrieval system of claim 1, wherein the system comprises 40 or more slots.

Claim 17. (Original) The compound storage and retrieval system of claim 16, wherein the system comprises 100 to 300 slots.

Claim 18. (Original) The compound storage and retrieval system of claim 1, wherein the slots each comprise a unique bar code label.

Claim 19. (Original) The compound storage and retrieval system of claim 1, wherein the slots comprise one or more unique bar codes on two or more sides.

Claim 20. (Original) The compound storage and retrieval system of claim 1, wherein each slot is associated with one or more tray location indicators under control of the computer system.

Claim 21. (Original) The compound storage and retrieval system of claim 20, wherein the one or more tray location indicators comprises a light emitting diode, a light, a buzzer, a flag, or an alphanumeric indicator.

Claim 22. (Original) The compound storage and retrieval system of claim 1, wherein the slots comprise one or more lengthwise rails to slidably receive the trays.

Claim 23. (Original) The compound storage and retrieval system of claim 1, wherein the trays are adapted to receive one or more containers selected from the group consisting of: tubes, bottles, culture dishes, vials, and microtiter plates.

Claim 24. (Original) The compound storage and retrieval system of claim 23, wherein the microtiter plates comprise: 96-well plates, 384-well plates, or 1536-well plates.

Claim 25. (Original) The compound storage and retrieval system of claim 23, wherein the microtiter plates comprise one or more sample wells, and which microtiter plates comprise a seal over wells.

Claim 26. (Original) The compound storage and retrieval system of claim 23, wherein the containers each comprise a unique bar code.

Claim 27. (Original) The compound storage and retrieval system of claim 23, wherein the one or more containers comprise a plurality of compounds.

Claim 28. (Original) The compound storage and retrieval system of claim 27, wherein the plurality of compounds comprises: a chemical compound, a biochemical compound, a nucleic acid, an oligonucleotide, a peptides, a polypeptide, a protein, a carbohydrate, a cell, a serum, a phage particle, a virion, an enzyme, a cell extract, a lipid, an antibody, or a synthetically modified peptide.

Claim 29. (Original) The compound storage and retrieval system of claim 1, wherein the trays comprise 2 to 12 nests each of which are configured to hold one deep well microtiter plate, three standard microplates, or four shallow microplates.

Claim 30. (Original) The compound storage and retrieval system of claim 1, wherein the trays comprise polycarbonate.

Claim 31. (Original) The compound storage and retrieval system of claim 1, wherein the trays comprise one or more bar coded identification label.

Claim 32. (Original) The compound storage and retrieval system of claim 1, wherein the trays comprise one or more handles.

Claim 33. (Original) The compound storage and retrieval system of claim 1, wherein the trays comprise one or more alphanumeric label.

Claim 34. (Original) The compound storage and retrieval system of claim 1, wherein the trays comprise one or more color coded labels comprising: a unique color or a color combination corresponding to a particular column or row of slots.

Claim 35. (Original) The compound storage and retrieval system of claim 1, wherein the computer system comprises: one or more data input sources, one or more data storage locations, and one or more data output devices.

Claim 36. (Original) The compound storage and retrieval system of claim 1, further comprising a robotic system controlled by the computer.

Claim 37. (Currently amended) The compound storage and retrieval system of claim 36, wherein the robotic system is configured to perform one or more operations selected from the group consisting of: opening the door, ~~seaming~~ scanning barcodes on trays, retrieving the trays from the slots, closing the door, removing plates from the trays, ~~seaming~~ scanning barcodes on plates, and sipping or pipetting a sample from plates or containers.

Claim 38. (Original) The compound storage and retrieval system of claim 35, wherein the data input sources comprise a bar code reader.

Claim 39. (Original) The compound storage and retrieval system of claim 35, wherein the data input sources comprise one or more operator input devices.

Claim 40. (Original) The compound storage and retrieval system of claim 35, wherein the data input sources transmit data to the computer, which data comprises: one or more of a work area temperature, a storage module temperature, a work area oxygen level, or a storage module oxygen level.

Claim 41. (Original) The compound storage and retrieval system of claim 35, wherein the data storage locations comprise a plate database.

Claim 42. (Original) The compound storage and retrieval system of claim 41, wherein the plate database comprises data selected from the group consisting of a library name, a sub-group

description, a mother/daughter plate designation, a plate type, a plate creation date, a plate location, a compound structure for each well, and a volume for each well.

Claim 43. (Original) The compound storage and retrieval system of claim 42, the plate database further comprising a mother plate history comprising one or more of a plate activity date, a volume removed per sample and a volume remaining per sample.

Claim 44. (Original) The compound storage and retrieval system of claim 42, wherein the plate location comprises a tray location.

Claim 45. (Original) The compound storage and retrieval system of claim 35, wherein the data output devices display one or more of a work area temperature, a storage module temperature, a work area oxygen level or a storage module oxygen level.

Claim 46. (Original) The compound storage and retrieval system of claim 35, wherein the data output devices display one or more instruction for an operator.

Claim 47. (Original) The compound storage and retrieval system of claim 46, wherein the data output devices comprise a computer monitor.

Claim 48. One or more library of compounds stored in the compound storage and retrieval system of claim 1.

Claims 49-68 (Cancelled)